

# AN OVERVIEW OF MESUR PATHFINDER ENTRY, DESCENT, AND LANDING SYSTEMS

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## Abstract

The Mars Environmental Survey (MESUR) Mission consists of two phases: 1) Pathfinder and; 2) Network. The first phase will demonstrate technologies to ultimately enable population of the Martian surface with a network of relatively inexpensive science stations. The most demanding of these enabling technologies is the entry, descent, and landing methodology for getting the payload safely to the surface. Due to the limited budget available for the network mission, it is desired to use as much existing technology as possible from the Viking mission. However, the expense of implementing some of the Viking methods is inconsistent with the Pathfinder budget, which is capped at 150 million (FY'92) dollars. Hence the Pathfinder team has developed a methodology which strikes a balance between existing and new technology, especially when cost and risk are considered.

This paper presents an overview of the Entry, Descent, and Landing (EDL) approach under development for the Pathfinder mission. For historical perspective, the discussion begins with a brief review of the Viking mission and its landing systems. The conceptual Pathfinder mission is then described in response to mission requirements. Details are presented for each of the EDL subsystems, which include an Aerobraking subsystem, Parachute and Deployment subsystem, Rocket Assisted Deceleration subsystem, and the Airbag Impact Attenuation Subsystem. Since the available Earth test environments and the Mars mission environments differ greatly, a discussion of the proposed approach for qualification of each subsystem, and verification of the entire EDL system is included.